RELAXATION

OF THE

PELVIC SYMPHYSES

DURING

PREGNANCY AND PARTURITION.*

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(Read before the Medical Journal Association of New York, December 3, 1869.)

Mr. President and Gentlemen :—I propose to advert briefly, this evening, to a condition not so generally recognized in this country as it might be, but which in Italy, Germany, and France has received a merited amount of attention. I allude to relaxation of the pelvic articulations during pregnancy and parturition.

This condition has been known and commented upon since the time of Hippocrates, but it is a noteworthy fact, that but few of the systematic writers on obstetrics refer to it. Still, we find a few monographs and

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isolated allusions to it scattered through medical literature by the most eminent authorities, among whom are Winckel, in his Pathologie und Therapie des Wochenbettes, Berlin, 1866; Ballochi, Manuel. di Obstet. Milan, 1859; Cazeaux, Traité Théorique et Pratique de l'Art des Accouchements, Paris, 1867; various writers in Schmidt's Jahrbucher, Nos. 1, 8, 58, 103, and 130; Blundell, Griffith, Debout, Erichsen, Jacquemier; Trousseau, in his Leçons Cliniques sur le Relachement des Symphyses du Bassin; Courot, Desormeaux, Churchill, Meissner, Smellie, Stoltz, Luschka, Albini, Laborie, Cruveilhier, Ercole Galvani, Velpeau, Lenoir, and Dubois.

The affection appears to consist of a relaxation of the pelvic articulations, becoming apparent suddenly after parturition, or gradually during pregnancy; and permitting of a degree of mobility of the pelvic bones which effectually hinders locomotion, and gives rise to the most peculiar, distressing, and alarming sensations. It can, perhaps, be best illustrated by the following case by Dr. Duplain.

The patient, Madame ——, was 26 years of age, of a lymphatic temperament, married four years, and the mother of three children. The last child was born about the middle of May, 1867, after a labor lasting twenty-two hours, and was a child of unusual size. After its birth she was almost constantly confined to the bed, from the difficulty, and indeed impossibility of walking, and a singular and distressing sensation, as if the abdominal viscera were about to fall through the pelvic outlet. She also had vague pains, increased on

motion, in the hips, at the symphysis pubis, and in the loins. As for the other symptoms, her appetite was good, her sleep sound, pulse normal, bowels regular, and urinary secretions healthy. The vaginal touch disclosed no malposition, or other disturbance of the uterine system. On palpation, the abdomen was supple and lax. On examining the patient in a recumbent position, the lower limbs presented nothing abnormal; their sensibility was intact, and movement was free and painless. But immediately upon arising, the sensation complained of returned with much severity, walking was accomplished with difficulty, and she dragged one foot after the other, inclining herself to the right and left as the case might be. On compressing the pubic and sacro-iliac symphysis some pain was experienced.

From the symptoms supervening upon delivery, the physician, M. Duplain (eliminating the possibilities of disease of the spinal cord, of the pelvic viscera, lumbo-abdominal neuralgia, &c.), judged it to arise from a relaxation of the pelvic symphyses, and the sequel justified the accuracy of the diagnosis.

A bandage was placed about the pelvis and hips in such a manner as to compress and confine the articulations firmly. Walking immediately became easy; she could maintain an upright position, the pains disappeared, and at the end of two months, without any other treatment, the patient left off her bandage and found herself entirely cured.

This may be regarded as a typical case of *uncomplicated* relaxation of the pelvic symphyses.

Of a similar nature was the following case occurring in the experience of the writer. Mrs. H——, aged twenty-two, primipara, was safely delivered on the 14th of last August of a healthy female child, at full term. The labor was short, lasting but eleven hours; the presentation normal, and delivery was accomplished without accident. The case progressed favorably in every respect until the tenth day after confinement, when she was allowed to leave her bed. She almost immediately complained of the great difficulty of walking, and of the singularly distressing sensation caused by motion in an upright position. I made a digital examination, expecting to find malposition of the womb. I found that there was relaxation of the anterior wall of the vagina, but the womb was high up, and not larger nor heavier than it should be at such a time. I advised rest in the recumbent position, and (the lochia having ceased) injections of alum and water, a pill of two grs. of the extract of gentian and one-fourth of a gr. of extract of nux-vomica, as a general tonic. At my next visit, two days afterwards, having remained the greater part of the time in a recumbent position, she was somewhat improved, but the improvement was but temporary. At a subsequent visit I found her in tears, all her symptoms and sensations having returned. They were peculiar. There were vague pains in the pelvis, no particular sense of dragging or weight, none of the train of nervous symptoms which attend uterine displacements; but her main complaint was of the impossibility of walking. She could not tell why, nor for what reason, but she simply could not do

it. After dragging herself partly across the room, her sensations became so peculiar and unendurable that she was forced to sit down at once, lest she should fall. Professor Barker, who saw the case in consultation with me, thought that it might be a case of relaxation; and I therefore examined her in an upright position, by grasping the symphysis pubis, from before backward, between the two fingers in the vagina and the thumb upon the mons veneris, and then directing the patient to balance herself first upon one leg and then upon the other. The movement of the bones was distinctly felt, one upon the other, to the extent of a quarter of an inch or more. A girdle firmly applied about the hips relieved her in two months.

Trousseau presents four similar cases. The patients had had one or more previous labors, followed by normal recoveries. The children's heads were not of abnormal size. The patients were either absolutely unable to walk, or could not maintain the erect position. They complained of pains in the thigh and pelvis, or in walking they twisted the legs one over the other. Standing upon one foot was almost out of the question, when the symphysis pubis was the seat of the relaxation; and in some it caused violent pains in the groins, if the sacro-iliac symphyses were affected.

Dr. Hodge mentions a marked case. About two months previous to the birth of the patient's fifth child, while walking across the room, she was suddenly checked in her progress by the seeming dislocation of the pubic bones, which she believed to be jointed; causing intense agony, accompanied by a sound like a pistol-

shot. Leaning on something near by for support, her movement caused the bone to slip into place again, when she was enabled to take a few steps, but with great suffering. These painful sensations and sounds occurred again and again, when attempting to get up or lie down, till the birth of a fine large child, which, it may be well to say, caused less pain than she had ever experienced on any previous occasion; leaving her, however, with so-called prolapse of the womb, and the innumerable distressing sensations of such disease, for eighteen months. She then became again pregnant, and enjoyed good health until two or three months before confinement, when she suffered as before until the birth of the child, which, contrary to expectation, brought no relief. The pain in the bones seemed permanent; numbness and stiffness were present in the left hip, which also gave way with a noise and pain when she would lift her foot. She then dragged it as if paralyzed. This continued for six months, until she was taken to Philadelphia, where she was relieved of some of her suffering; but ten months elapsed before she was sensible of a decided improvement in the condition of the bones. Dr. Hodge speaks of it as a peculiar phenomenon in connection with a retroverted uterus, disappearing upon the removal of the displacement, but does not allude to the disease under consideration.

Pigeolet saw a woman, who, after a difficult instrumental labor, was obliged for a long period to keep her bed, with protracted pains in the pelvis. On the fourth day of the second labor she had chilliness about the pelvis and torpor of the lower extremities. The patient was

forced, in order to ease herself, to maintain a flexed and curved position in bed, any motion of the pelvic symphyses causing dull pain and an unpleasant sensation of crawling and formication in the lower extremities. Urinating was accompanied by pain in the symphyses, and the bowels were torpid. She had no fever. After putting on a pelvic bandage the disease yielded in six weeks.

Putegnat refers to two cases. One was a woman four days delivered of twins, who made a few steps in her chamber, and the next day she experienced a slight pain in the symphyses on motion, which endured for a long period. At the same time the walk was uncertain and tottering. Cupping, general baths, tonic frictions, absolute rest, and a pelvic bandage were used, and the next labor was accomplished without further untoward consequences.

Another case was happily cured by compression of the pelvis. Both of these patients were healthy and robust women.

Courot cites two cases. The first of them arose from an abortion. Walking was impossible, and standing painful. After wearing for four months Martin's girdle, the patient was so far cured that she could undergo great fatigue. The second case involved the left sacro-iliac symphysis. Martin's girdle was worn during pregnancy, although throughout its pressure was annoying. She remained twenty-five days in bed and then resumed it, wearing it three months more, and was then able to leave it off. By the third pregnancy the disease was not reproduced.

The pubic symphysis in common with the sacro-iliac articulations belongs to the second class of the amphiarthrodial or mixed articulations; those, namely, in which the surfaces are connected by fibro-cartilage, and lined by a partial synovial membrane. I here present a drawing, (Fig. 1,) after Cruveilhier, representing a section of

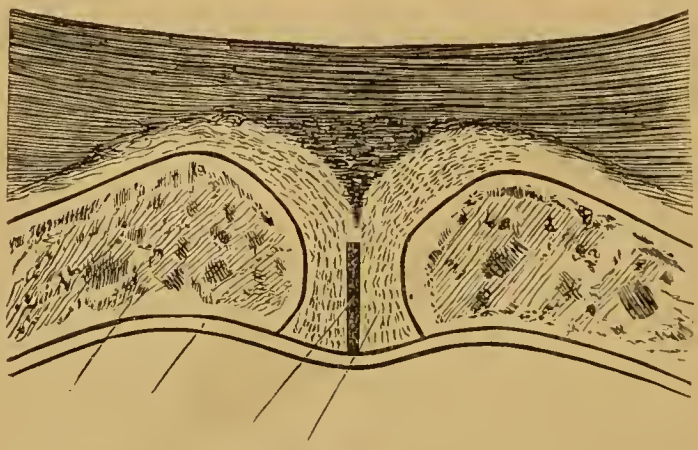

Fig. 1.

the pubic symphysis coinciding with the plane of the superior strait. Its articulating surfaces are oval, of large diameter obliquely below and behind, bevelled from behind forward, and from within outwards; from which there results in front a triangular space of separation, the base of which is directed forwards, and the apex backwards.

The inter-articular fibro-cartilage consists of two oval-shaped plates, one covering the face of each articular surface. They vary in thickness in different subjects, and project somewhat beyond the level of the bones, especially behind. Each is firmly attached to the bone

by a number of nipple-like processes which accurately fit within corresponding depressions on the osseous surfaces.

Their opposed surfaces are connected throughout the greater part of their extent by an intermediate fibrous elastic tissue called the inter-osseous ligament, Fig. 2,

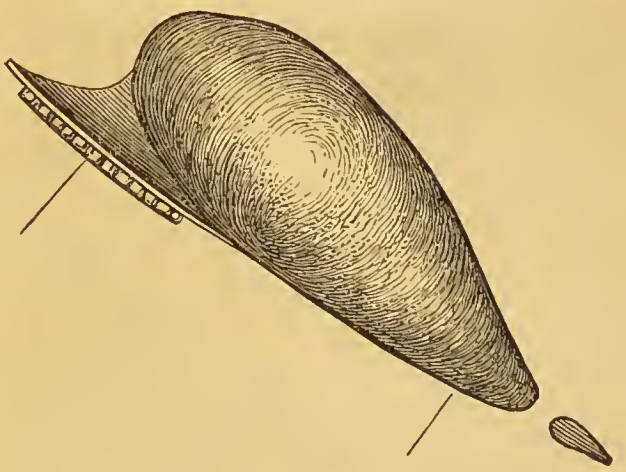

Fig. 2.

and by their circumference to the various ligaments surrounding the joint. An interspace is left between the two plates of cartilage at the upper and back part of the articulation, where the fibrous tissue is deficient, and the surface of the fibro-cartilage lined by epithelium. This space is found at all periods of life, both in the male and female, but it is larger in the latter, especially during pregnancy and after parturition. It is most frequently limited to the upper and back part of the joint, but it occasionally reaches to the front, and may extend the entire length of the carti-

lages. The accompanying sketch, Fig. 3, of a vertical section of the symphysis pubis, made near its posterior surface, well displays these various points.

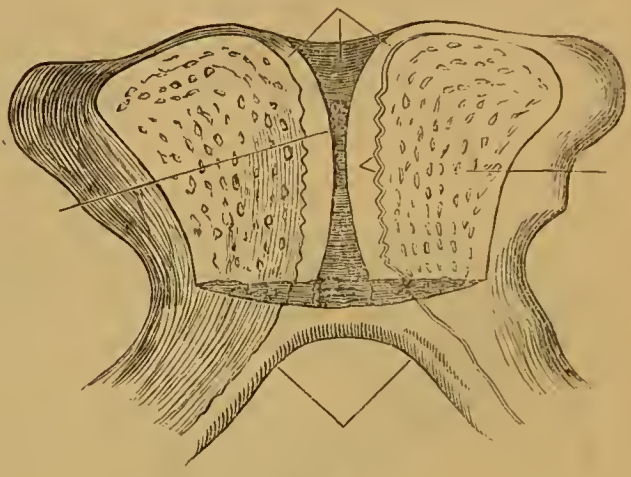

Fig. 3.

The extent to which the two articular surfaces are in apposition, it must be borne in mind, varies greatly in different subjects. Occasionally the two surfaces will be continuous throughout their whole extent, while again it will be found, in another subject, that the surfaces touching one another are quite limited.

The joint is further strengthened by four ligaments, named respectively, from their positions and functions, the anterior, posterior, superior, and sub-pubic ligaments.

The anterior ligament consists of several superimposed layers, which pass across the anterior surface of the articulation.

The superficial fibres pass obliquely from one bone to the other, decussating and forming an interlacement with the fibres of the aponeurosis of the external oblique. The deep fibres pass transversely across the

symphysis, and are blended with the inter-articular fibro-cartilage. The sub-pubic ligament is a thick triangular arch of ligamentous fibres connecting together the two

Fig. 4.

pubic bones below, and forming the upper boundary of the pubic arch.

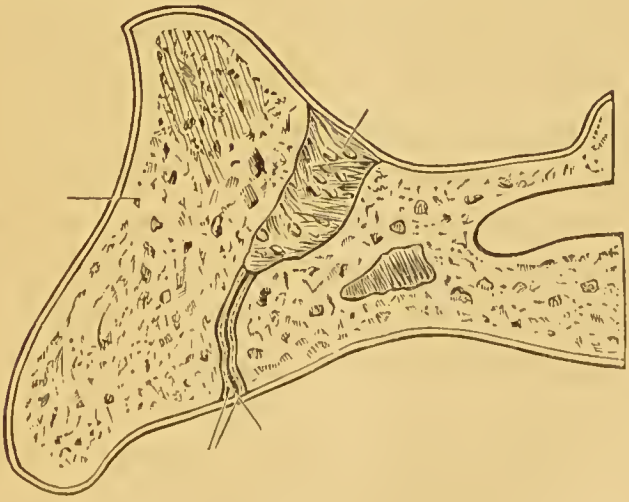

Fig. 5.

The sacro-iliac articulations, of which Figs. 4 and 5 are vertical sections, though of the same class, are more

intimately linked together than the symphysis pubis. The articular surfaces are not in apposition throughout their whole extent. That portion which is continuous is posterior. The articular surfaces are sinuous, alternately concave and convex, and have a double obliquity so contrived that those of the right side converge with those of the left, towards the summit of the sacrum on the one hand, and towards its upper and posterior face upon the other; in such manner that a force applied perpendicularly to its superior and posterior surface would tend to force it easily into the pelvic cavity, were it not for the sinuosities of its surface and its peculiar mode of union, which is as follows: The articular surfaces are "*revetted*" throughout their whole extent with a layer of cartilage, thicker upon the sacrum than upon the ileum. The cartilage is remarkable for the roughness of its surface, which contrasts with the glistening aspect of other articular cartilages. A synovial membrane, difficult of demonstration in the adult and aged, but quite manifest in children and in females during pregnancy, lines its cavity. The interosseous ligament is the most powerful of all its means of union. It is composed of a multitude of interlaced ligamentous fibres, extending horizontally from the sacrum to the ileum, almost completely filling the deep excavation between the two bones. The other peripheral ligaments are mere reinforcements to the strength of the joints. They are the anterior, posterior, inferior, and superior sacro-iliac. To these may, perhaps, be added an ileo-lumbar and sacro-spinal ligament, of but little moment in this connection.

Laborie insists, however, with regard to the pubic symphysis, that the two opposed articular surfaces have not the same conformation, but that the left is smaller and obscurely convex, after the fashion of the rudimentary head of a joint; and that it sinks into the opposite articular surface. Of this relation I have not been able to satisfy myself. Were it so, it would certainly tend to increase the rigidity of the articulation, but for the fact that the interposed fibro-cartilage and the bevelling of the bone-ends on all sides acts as a counterpoise. He also insists upon a peculiar hinge-like motion of the whole pelvis during labor. He thinks that upon the entrance of the fœtus into the superior strait any movement of the bones is impossible, but as the head passes down and reaches the inferior strait, a sort of hinge-like movement is acquired, the tuberosities of the ischia being separated, and the crista ilii approximated. This, however, can hardly be considered as established. Drs. Galvagni and Golinelli experimented upon a cadaver, but were unable to demonstrate the hinge movement. They did find, however (the subject, by the way, being a woman who had died of puerperal eclampsia), that the sacrum could be moved up and down between the two ossa innominata to a sensible extent when the pelvis had been separated from the trunk and limbs. On section of the symphysis pubis, a distinct cavity with irregular walls, and of a blunt ovoid form, was found in the centre, as stated above.

Many will be slow to believe that so intimate a junction, so firm an articulation, should admit of

motion, but the evidence upon the point is too overwhelming to admit of question.

As a concomitant of the pregnant and puerperal state, it has been maintained by numerous authors from the earliest times, including even Hippocrates. Chailly held that softening of the pelvic ligaments was a constant and normal phenomenon during pregnancy. Jacquemier thinks that the ligamentous union of the pelvic bones is always swollen to a third or even one-half greater volume during pregnancy. Velpeau concurs in the view of Chailly. Lenoir asserts that there is a decided widening or increase of the pelvic diameter towards the close of gestation. Dubois acknowledges the essential mobility of the pelvic bones by comparing them to the tarsal articulations, as being designed to prevent shock to the body in an upright position.

As to the *modus in quo* of its production, authors vary. Stoltz insisted that the unquestionable relaxation of the pelvic symphyses which sometimes takes place is almost always of a pathological origin, and that there is no adequate reason why it should be considered as a physiological condition pertinent to the puerperal state, and designed to facilitate parturition by permitting of distention and enlargement of the pelvic canal.

Laborie is of the opinion that the pelvic symphyses must be regarded as allowing of movement *à priori*, in consequence of their structure; although their motion is hindered almost completely (except during pregnancy) by the rigidity of the sacro-iliac symphyses.

Luschka, in his researches on the imperfect joints of the human body, holds that the pelvic articulations are

not true symphyses, but more or less complete joints, with apposed faces, covered with cartilage, and provided with synovial membranes; and that in pregnancy these imperfect or half joints are greatly augmented in volume in consequence of a copious secretion of synovia (which at other times is only present in inconsiderable quantities)—the necessary consequence of which is a certain mobility of the pelvic bones. Serverin Pineau made a dissection of a woman recently delivered in the presence of Ambrose Paré, and demonstrated the relaxation to the satisfaction of the latter.

Others think the interosseous substance acts like a piece of prepared sponge, which forces the bones apart by absorbing fluids at this period. Others again imagine it to resemble the roots of the ivy, which by insinuating its fibres between the stones of a wall or building end by overturning it; others, that the cartilages act like dry, porous wooden wedges, which force the bones apart by their swelling, or make a place for themselves by development, as in the case of polypi in the nasal fossæ or frontal or maxillary sinuses.

Lenoir says that a slight degree of this relaxation is due simply to serous infiltration of the pelvic ligaments resulting from the pregnant condition.

Dr. Martinelli, in a paper read before the Imperial Academy of Medicine in February, 1867, maintained the following propositions, viz.:—

That the different parts of the female pelvis were movable in a high degree during pregnancy and labor, and that this mobility is not fortuitous, but an indispensable condition of child-birth; that the peculiar in-

sertion and arrangement of the abdominal muscles acts with a powerful leverage to bring about the movement of the pelvic bones, and that it is further favored by the smaller extent of the articulating surfaces in woman and the general ramollissement of the ligaments at the period of child-birth. Such muscles he considers the rectus abdominis and obliquus externus abdominis and the four abductors of the thigh.

According to Baudeloque, however, this relaxation may actually retard labor by destroying the *point d'appui* which the abdominal muscles derive from the bones of the pelvis; and perhaps, also, the unusual distress occasioned by the engagement of the head forces the woman to restrain the pains as much as possible. It will be seen further on, however, that, on the other hand, in small or osteomalacious pelves, labor may be rendered easier and a spontaneous delivery take place, which but for this relaxation would have been utterly impossible. This separation has been known by Luschka, Morgagni, and Hunter, to reach an inch and more.

Matthews Duncan (in his late work, entitled "Researches in Obstetrics") says, that these changes in the pelvis towards the end of gestation are beautifully exemplified in the lower animals, in many of whom they are found to a much greater extent than in the human female; as, for instance, in the guinea-pig, in whom the pubic symphysis gives to the extent of an inch or even more.

In the cow, whose pubic symphysis is ossified, there takes place a remarkable change, demonstrated by Professor Barlow, of the Veterinary College, viz.: a great

increase in volume and a relaxation of the sacro-sciatic ligaments, rendering them slack and yielding; and the sacro-iliac joints, which are described in the unimpregnated animal as secured by a substance resembling intervertebral substance, now have the opposing surfaces smooth and lubricated. By this means the ilii become extensively movable upon the sacrum (or *vice versâ*), in an antero-posterior direction. The final result of these changes is to enlarge the genital passages in the animal.

Mr. Zaglass, in 1851 (Monthly Journal of Medical Science, September, 1851), demonstrated the distinct motion of the ossa innominata in an antero-posterior direction in the human subject.

This softening, relaxation, or ramollissement, however, does not as yet constitute a pathological condition, but probably forms a part of the general preparation for the parturient act, taking place throughout the system of the woman, of the same nature as the marked relaxation of the vulva and vagina at term. A natural explanation, therefore, of the occurrence of separation would be that the bones in the relaxed condition of the ligaments are forced asunder by the impact of the fœtal head; and Ulsamer actually thus accounts for it.

But what are we to say to those cases occurring after abortion, when the child's head can hardly have much concern in producing the rupture, and still more in those cases occurring during the seventh and eighth months of gestation, before the child has been born at all?

As we have seen, many authors speak of a constitu-

tional diathesis, or cachexia, as the principal cause of the affection; but Debout found that, out of nineteen cases, nine occurred in robust individuals. Others have accused abdominal plethora, and the pressure of an unusually enlarged and heavy uterus, as a determining cause; and again great physical weakness or prostration.

Churchill speaks of diminished firmness of the symphysis pubis as associated with morbid irritability of the neck of the bladder during pregnancy, which irritability often spreads as far as the vulva. But as such conditions may be regarded as common in all pregnancies, and as the occurrence of relaxation to the extent of actual separation between the bones is rare, they can scarcely be regarded as *causes*, although they may be *characteristic concomitants* of the disease.

I think it is not forcing a conclusion to regard it as proven from what has been advanced that an uncertain, varying degree of relaxation or ramollissement does obtain in a very large number of cases, in the pregnant and puerperal condition, of a physiological and benign character, and entirely consistent with health, and that it is to the excess alone of this condition that the pathological results above described are due. The ligaments become saturated with serum and lose their firm and resilient qualities; the synovia is greatly increased and presses the bones asunder; the pelvis becomes incapable of sustaining the weight of the body, and so gradually yields to the weight above; or some slight and insignificant movement of the patient suffices to precipitate the whole train of symptoms suddenly and at once. I am convinced that more such cases

occur than is generally believed. There are so many distressing sensations incident to the lying-in state, that if the affection be but slight and non-persistent it is most natural to attribute it to the puerperal condition, or to some uterine displacement or irritation. Women themselves are so accustomed to vague pelvic and uterine and lumbar pains, that they almost regard them as a natural heritage, and themselves assist in deceiving the physician by ascribing them to the uterine system.

Although the first symptoms frequently become apparent only after delivery, they also often occur during pregnancy and abortion; of which Courot and Hodge both give instances. If occurring during pregnancy, it may follow some unusual exertion, but such is by no means a necessary antecedent. In such case it occurs suddenly, and all its peculiar symptoms are at once developed, as is also the case when it occurs after delivery.

To determine whether separation has occurred, we may, by flexion and extension of the thigh, with the hand of the physician placed over the symphysis pubis, feel the pubic bones moving up and down under the hand, but without crepitation. The same result is perceptible on laying the hand upon the hip-bone, when that is affected. Jacquemier has caused by dragging upon the thighs a sensible sinking down of the os ileum. In one of Trousseau's cases, the end of the finger could be laid in the space between the pubic bones in the softened condition of the inter-articular fibro-cartilage, and this has often occurred in other cases.

Erichsen speaks of change in the form of the hip-bone taking place, and in the length of the limbs, when the relaxation was of one sacro-iliac symphysis alone. He thinks that the antero-superior spinous process of the diseased side stands lower and flares more than the opposite side, because of the swelling of the diseased joint, by which the ilium is forced outwards and forwards.

The pains bear no relation to the extent of mobility of the symphyses, but in the worst cases known the patient can neither stand nor walk, and the disease is complicated with paraplegia.

To recognize the mobility of the sacro-iliac symphysis, one should embrace the pelvis with both hands and allow the patient to walk alone or with a support. One feels at each step that the os ileum at the side on which the trunk rests plainly rises, while the other is apparently lower.

But, as has been said before, in all these cases it is more than easy to be deceived, as the patients on being questioned are rarely able to define clearly the seat of their sufferings, and the real affection is overlooked if care be not taken to make a direct examination. How often is the uterus regarded as the source of the pain, when the lesion is precisely located in the pelvic articulations.

As to the termination of the disease, in slight cases a few weeks is sufficient to effect a cure; and even without its being recognized, indeed, it being confounded with the general condition pertaining to the lying-in state; but in some cases it may endure for many years;

according to Debout, in two cases respectively for seventeen and fifty years.

The most favorable period as regards recovery is pregnancy and the puerperal state. Light cases reconsolidate of themselves during complete rest. In severe cases Martin's girdle may be used for circular compression of the pelvis. It consists of a very solid metal ring surrounding the whole pelvis. The spring is an inch and a third broad, padded in the same manner as a truss, both branches or arms of which are directed forwards and downwards, where they are fastened firmly by a buckle. The apparatus can also be worn during pregnancy without interfering with the enlargement of the womb and belly. In cases where Martin's girdle, however, causes discomfort or is too heavy, I would suggest the use of a strong sole-leather apparatus, properly *moulded* to adjust itself to the shape, and secured in the same manner as Martin's apparatus. It will be found lighter and quite as firm, if properly constructed. By the later use of the girdle, for instance, even more than one year after delivery, a cure may be effected, but it is sounder policy to have recourse to it at as early a period as the disease may be recognized. If the disease should, in spite of the wearing of the girdle, last many years, still, *with it* the patient has the power of walking, which, without it, would be utterly impossible. Griffiths recommended cold vaginal injections, cold baths, cold douches, vesication and stimulating frictions. Rest and the recumbent position, however, are the most efficient aids to recovery, if not carried to such an extent as to damage the general health of the patient.

Going up and down stairs is eminently unfavorable, and it is desirable to have the patient's apartments upon the first floor, if possible, so that, if her social condition be such as to enable her to avail of it, she may have carriage exercise without detriment, and in any event will not be obliged to ascend to her sleeping apartment.

But this is not the only diseased condition of the pelvic articulations incident to pregnancy, nor by any means the gravest. *Suppurative inflammation*, with its attendant dangers, frequently sets in and carries off the patient in spite of all that care or skill can do, after the most protracted and agonizing suffering—and furthermore (what would seem at a first glance an actual impossibility), *rupture* of the symphyses may take place as a crowning result.

The first of these, viz., suppurative inflammation, has been treated of by Hiller, Monod, Danyau, Hayn, and others. It may arise either before or after labor, as in the case of simple relaxation, and its earlier symptoms are very similar; viz., pain in the symphyses of varying degree, greatly aggravated by movement and sometimes intermittent; crawling and pricking, and occasionally numbness in the lower extremities, and tottering and uncertain gait. The gait varies according to the part affected; and in one case a woman could only walk with bent knees dragging the feet over the floor, without the ability to raise them in the least.

When the pubic symphysis is the point affected, dysuria is apt to be present; and where the sacro-iliac symphyses are the seat of inflammation there is tenesmus and pruritus, especially during defecation. On the

occurrence of suppuration the symptoms assume a gravity which should put the accoucheur on his guard. Fever, followed by rigors, sets in, the patient's countenance is expressive of anxiety, the tongue becomes furred and the bowels confined, together with the other symptoms of the inflammatory condition. The case assumes, in fact, the aspect which is peculiar to suppurative inflammation in the cavity of a joint; and of course the prognosis is eminently unfavorable. Death may indeed occur before suppuration sets in, but if this occur, extensive abscesses are formed in various parts. If it be the pubic symphysis which is affected, pus forms about the mons veneris, and burrows along the vagina and down into the thighs. If of the posterior symphyses, of which the right is more often affected than the left, it may cause purulent collections in five different places; viz., directly upon the joint, in the gluteal region, in the lumbar region, in the pelvic sub-peritoneal pouch, and, lastly, near the rectum, whence it may spread to the gluteal region, to the greater trochanter, or to the horizontal ramus of the pubes. Caries of the bones may take place, and it then runs a tedious course, and then invariably ends in death. Anchylosis seldom takes place. The cartilages are loosened, and the soft parts infiltrated with serum, pus, and ichor.

Its diagnosis is not difficult. In distinguishing between it and simple relaxation, it should be borne in mind that, in consequence of the inflamed condition of the symphyses, the difficulty of walking stands in direct relation to the intensity of the pains, and that in general the patient has more control over the lower limbs

in consequence of the bones being still held in place by the inflamed cartilages; and especially does this hold good when the inflammation is confined to one symphysis alone. The vaginal touch, the imposition of the hand upon the affected points during movement of the patient, and the probe after the evacuation of abscesses, will be found sufficient to establish a diagnosis.

The treatment should be directed primarily against the inflammation and the collection of pus, and rest enjoined in the recumbent position. After the subsidence of the inflammation, a pelvic bandage should be worn for a lengthened period.

In slight cases the affection may be so insignificant as to be confounded with the general results and inconveniences of the lying-in state, and attract no particular attention, and pass off with rest and quiet. In others it may be so severe as to call for some treatment, though generally it is not even then that its true nature is recognized, as the patient recovers after a few weeks of discomfort and confinement. But treatment should be prompt and decided even in these cases, lest there should ensue the deplorable results detailed below.

The following instructive cases are published by Dr. E. Schmiedt, and are drawn from various sources. The two first are by Trousseau.

One was a woman, forty years of age, who was seized, seven weeks before labor, with pains in the pelvis. At the commencement of labor she was attacked with fever and an intermittent pain in the right hip joint. An abscess soon formed in the gluteal region, and by an exploratory incision in the region of the

right sacro-iliac symphysis several drops of greenish putrid pus were evacuated. The patient soon left the hospital, and nothing more was heard of her. The second case was that of a woman, delivered five days previously, who felt a pain in her right hip, was unable to walk, and had chills and fever. The pains extended themselves to the nates and symphysis pubis. Four months after, fluctuation was detected over both sacro-iliac symphyses, from which a large amount of pus was evacuated on opening it. After some days death ensued, and the sectio cadaveris showed both sacro-iliac symphyses denuded of cartilage; and in the symphysis pubis, which contained pus, the cartilages were loosened. No metastatic abscess or other changes were found in any other part. Hayn relates two cases. One, a woman 29 years of age, had had two successful deliveries, the last one being a triple birth, and the children small. On the third day after labor, pains occurred in all three pelvic symphyses, particularly the right sacro-iliac symphysis. Pressure on either side caused pains in the corresponding symphysis as far as the pubic symphysis. Active movement of the extremities was impossible, passive motion painful. There was present, also, a severe diarrhœa. On the seventh day there appeared a swelling on the back of the right hand. By powerful pressure upon the right side of the pelvis a rubbing or friction noise was apparent. She died on the tenth day. On examination pus was found in all the symphyses, especially in the right one. Also, a woman forty years of age, in the first day of her second confinement, after a successful delivery, was seized with pains

in the pelvis. On the sixteenth day severer pains in the symphysis pubis occurred, radiating towards the thighs. After four days the attack passed off.

Dr. Galvagni had the opportunity of observing two cases of inflammation of the right sacro-iliac symphysis, in one of which death ensued from chronic miliary tuberculosis, and in the other from metastatic metrophlebitis.

Case 1.—A woman, A. P., aged twenty years, who had menstruated at fifteen years, had been troubled for some years with pains in the knees and a lameness resulting therefrom, and with an inguinal hernia of some standing. In her nineteenth year she had married, and soon became pregnant, and in the commencement had progressed very well. About the middle of the pregnancy she found herself fatigued after slight labor, and had pains in the sacrum and general malaise, and her walk soon became uncertain. On the 2d of December, 1866, she was delivered of a well-formed, though somewhat thin, full-term child. On the 8th the author found her out of bed, but she complained of pains in the sacrum, and walking was difficult, and particularly painful when she rested her weight on her right hip. One month later he found her much emaciated, without appetite, with a dry cough, and nightly perspirations, from which he inferred the occurrence of tuberculization, although the physical examination gave no support to the idea. On the right sacro-iliac symphysis there existed a circumscribed painful point; the lameness upon the right side was very marked, and the patient was obliged to support herself with a cane.

When the author saw the patient again, at the end of two months, he found her in a very critical condition, the apex of the left lung being gone, and the woman evidently in the last stage of consumption. From the vagina there flowed a yellowish green pus, which soiled her clothing. Over the right posterior symphysis there was discovered a small fluctuating swelling. Nevertheless, the patient was sitting up out of her bed the greater part of the day. The inflammation of the symphysis was now beyond question a matter of certainty.

During the next week, to the astonishment of the relator, the abscess became dissipated, the fever alternated with rigors, shiverings, and prostration, alternating with restlessness, until, after fourteen days, on the 24th of May, 1867, the patient succumbed.

On opening the thoracic cavity the right lung was found extensively adherent, containing several cavities of the size of a nut, and infiltrated with miliary tubercle. Tubercle also studded the peritoneum.

The whole generative apparatus was deeply injected; the Fallopian tubes indurated, the fimbriæ contracted, the os uteri livid, denuded of epithelium and in a fungoid condition. The inner surface of the cavity of the uterus was covered with a yellow caseous, adherent pus, which also filled the Fallopian tubes. In the pelvic cavity there was found on raising the peritoneal investment a sinus from three to four millimetres corresponding to the right sacro-iliac symphysis, and so great was the disorganization that the bones were only held together by the strong ileo-lumbar ligament, all

other ligaments being destroyed by suppuration. Pus in moderate quantity was found beneath the periosteum, and had denuded by its action two strips on the sacrum and ileum. These strips were nearly one centimetre wide, parallel, and extended over the three upper sacral vertebræ, which showed their bony surfaces roughened. The abscess extended itself along the hypogastric fossa, and along the pyramidalis at the sacro-sciatic notch, and following the ischiatic nerve, terminated in the gluteal region, without having formed any perceptible external swelling.

The external abscess, which had been visible during life, had become larger, and lay under the aponeurosis of the greater dorsal muscles—the sacro-lumbaris and longissimus dorsi; it was connected by three conduits or channels piercing through the multifidus spinæ, and connected with the diseased symphysis and both the intervertebral spaces of the sacrum. Deeper and more externally along the ileo-sacral ligament, which alone was unimpaired, there was a very small abscess extending from the symphysis. All these abscesses were lined with a pyogenic membrane. Their contents were very thick and caseous, and displayed under the microscope pus-cells resembling those which were found in the uterus and Fallopian tubes. The cotyloid cavity and head of the thigh-bone were denuded by the action of inflammation.

Case 2.—E. G., twenty years of age, of a delicate constitution, had suffered in youth from rachitis, the traces of which were still discernible in the form of

her bones. For many years she had been obliged to move partly by sliding herself along, and partly by aid of crutches; later she had been affected with miliaria and acute inflammatory rheumatism. Menstruation appeared in the fourteenth year, returning regularly. After a normal course of pregnancy, labor set in the 28th of October, 1863. The attending physician, after accomplishing turning, could not extend the head; so on the 29th the laboring woman was brought to the lying-in clinic with the lower portion of the dead child hanging out between her thighs, to ascertain whether the delivery could be accomplished by craniotomy, which was successfully done. On the next day the great volume and tenderness of the uterus was remarked, and treated by blood-letting. The lochia remained normal at first; the bowels were constipated. From the 3d of November there were severe pains in the hypogastrium, the abdomen swelled, the meteorismus occasioned considerable difficulty of breathing, the pulse rose to 120, and the heat of skin was greatly augmented. Under antiphlogistic treatment the fever had decreased again on the 9th. There was pain in the right knee and a painful swelling on the anterior aspect of the right forearm. On the fifteenth there appeared an abscess on the metacarpo-phalangeal joint of the little finger of the left hand. On this day the patient was seized with a shaking chill lasting one hour and a half, which was repeated on the 17th to a slight extent. On the 18th there occurred severe pains in the right sacro-iliac symphysis, which were increased by pressure and coughing. Quinine was administered. In the mean

time the abscess remained indolent, though increasing in size. On the 22d the pains in the symphysis had become much mitigated, although the fever and meteorismus had returned; a diarrhœa then set in, followed by pain and swelling in the right eye-ball, and sight was entirely lost. On the 30th of November there appeared on the upper lip small white blisters containing pus. She died on the first of December. On post-mortem examination there were found small abscesses in both lungs, the spleen was softened, the peritonæum unchanged, and the uterus reduced in size. On cutting into its walls, a single sac was found containing pus; under the raised peritoneal covering of the pelvis, in the region of the right posterior symphysis, a moderate collection of pus in the form of a small sinus. The other symphysis was sound.

The joint surfaces were not exposed, because the pelvis was to be preserved whole. The first described swelling contained pus. The direct pelvic admeasurement was two and two-thirds inches.

This paper has already reached such proportions that I feel I must refrain from touching upon the third condition mentioned; viz., rupture of the symphyses, of which I have the record of some eight cases. It usually occurs after a severe labor (instrumental or otherwise, as the case may be), and is caused by some disproportion between the fœtal head and the pelvis of the mother, or in some cases by one of the forms of malpresentation. It generally takes place in osteo-malaceous or rachitic pelves where the conjugate diameter is great-

ly shortened. It may take place in either the pubic or sacro-iliac articulation, but its favorite seat is the right sacro-iliac. It has been known to involve two symphyses at once. Where the pubic symphysis is the seat of rupture, one of the cartilages is torn loose, leaving the end of the bone bare and exposed.

Other causes are said to be constitutional feebleness of the mother, great size of, or ossification of, the sutures of the fœtal head, severity of the pains, cranial distortion, and the use of instruments.

When it occurs it is generally heard by the attendants and bystanders, and the woman is conscious of intense pain and a rending of the ligamentous fibres, and, as affecting the labor, is analogous to the results of symphyseotomy. Inflammation and suppuration set in with great rapidity, and are followed by a period of great danger to the patient, often ending in death.

[The subjoined remarks by Profs. Fordyce Barker and Isaac E. Taylor are from the minutes of the meeting, reported by Dr. Winslow.—ED.]

REMARKS BY PROFESSOR BARKER.

THIS is a subject of great importance, although barely alluded to by English writers for the last quarter of a century. By the ancients, and through the middle ages down to the present century, it was believed that this relaxation was a normal element in parturition; and it was this belief which suggested to Sigault the operation which was the occasion of so much excitement at the time, that of division of the symphysis pubis in cases of difficult labor. Sigault supposed that he was simply carrying out more completely the ordinary physiological process. But that his operation was based upon ignorance and misconception of the true mechanism of labor is shown by the fact that, as has

been demonstrated, it would require a separation of the pubie bones to the extent of at least an ineh, to gain *one* or *two* lines in the antero-posterior diameter.

The paper of to-night has been very rich in referenee to the foreign literature of this subjeet. I would say a word of the writers upon it in our own language, among whom Denman has given a very eomplete exposition of the affeetion, with details of some eases of great interest. He relates one where it was eight years before the patient reeovered sufficiently firm union of the symphyses to enable her to walk. In the Ameriean edition of Denman, edited by Dr. Franeis, there is a full note reporting a ease in the praetiee of Dr. Wright Post of this eity, and another of relaxation of the sacro-iliae symphyses from the praetiee of Dr. Hosack. Next to Denman, Burns gives the best diseussion of the subjeet. Ryan also speaks of it. Miller, Rigby, Ramsbotham make no mention of the matter; and Tyler Smith, Cazeaux, Churchill, and Bedford give it but a eursory allusion.

It has been my fortune to see quite a number of these eases, some of them involving points whieh I have not seen mentioned by any writer. The first oeeurred at the very beginning of my praetiee. A lady in the eighth month of her first pregnancy had for several days great diffieulty in walking, with severe pain in the pubie bones, till one day she fell while walking aeross her drawing-room. She supposed that she had eaught her toe in the earpet. From that time up to her eonfinement, she eould not walk or stand. After a very eareful examination, I was unable to make out the diagnosis; and none of the authorities at my command threw any light on the question. I therefore ealled in eonsultation two quite prominent surgeons; and one of them diagnostieated fraeture of the neck of the femur; the other, fraeture of the ilium or isehium. I watehed the case very anxiously, naturally expeeting a difficult labor, and some unto-ward result; but, to my surprise, the labor, though a first one, proved brief and easy, with no abnormal symptoms. The patient passed through the puerperal eondition with nothing to excite apprehension; yet on essaying to rise it was found that she was still wholly unable to bear her weight upon her limbs. Some six weeks after eonfinement, I got her out of bed, and carefully attempted to make her walk. A point which struck

me, and which I have never seen mentioned, was that she could stand with comparative ease resting upon either one leg or the other, but could not balance herself upon both legs at once. This of course convinced me that there was no fracture of the thigh-bone, and the fact that there was no difference in her ability to rest upon the two sides showed that there could be no fracture of the ilium or ischium. Led by this to examine the symphysis pubis, I thought there seemed to be an increase of the space between the pubic bones; and also that the cartilage between them seemed softer than natural. When I left the place, some four years afterwards, this patient was able to walk only with great difficulty, upon crutches. Three or four years later yet, she was much improved, though still compelled to use crutches. I am told that after the lapse of some fifteen years from that unfortunate pregnancy she has entirely recovered and walks perfectly well.

In hunting up my authorities with reference to this case, happening to turn to the anatomy of the pelvis in the first part of Denman's work, I found the key to the whole mystery. Since that time I have seen the affection in several other individuals; in one of whom, the wife of one of my colleagues, it has occurred in her last three pregnancies. As I before remarked, my observations have differed in some respects from those I have found recorded. In none of the cases I have seen has the relaxation of the symphyses been dependent in any degree whatever upon the process of parturition. But in all of them—and this fact may give a clew to the true pathology of the disease—the patients have had pelves very *broad* and capacious at the superior strait; and where I have seen them before confinement, the fœtal head has lain very low in the pelvic cavity during the last month of gestation. It has seemed to me that the œdema and consequent laxity of the ligamentous tissues may be due to the mechanical obstruction of the venous trunks by the pressure of the *presenting part* or the fœtal head. Again, in most of the cases, I have noticed after confinement pendulous belly, and great difficulty or impossibility of completely evacuating the bladder, doubtless due to over-distention during pregnancy, from the same mechanical cause which produces the œdema of the ligaments and of the lower extremities. The irritability of

the bladder, which, according to Churchill, as quoted by Dr. Snelling, is frequently attendant on these cases, is explainable by this retention of urine, and the mechanical *pressure on the urethra.*

To three of the cases I have seen, I was called in consultation. Nothing is more apt to damage the reputation of a young obstetrician than that a patient should fail to recover rapidly after child-birth, unless the obstacle to her recovery can be made perfectly clear. How unjustly a young man may often have to suffer from this cause may be seen from one of these three cases, which will serve as a type of all. A lady, in her third pregnancy, engaged to attend her a young physician in whom the family felt much interest and confidence. Both of her previous confinements had been favorable, under the charge of an old physician who had recently died. This third labor proved, to all appearance, perfectly normal, and the woman seemed to be recovering well, until she attempted to get out of bed, when she found that she could not stand. A week, two weeks passed, and the attempt was again made, with the same result. She not only could not stand, but the attempt caused severe pains in the pelvic bones. The case went on to, I think, about the eighth week after confinement, the patient with this exception perfectly well, when another gentleman was called in—a man much older and of more eminence as a surgeon than as an obstetrician. He discovered in the pelvis a hard tumor the size of a hen's egg, which he thought scybalous, as it proved to be. It was brought away by large injections, and an early cure was promised. The young man was severely blamed for neglect; but, unfortunately for his elder, the promised recovery did not take place. The surgeon treated the patient for some five weeks, with no perceptible change in her condition, when I was called in. A careful examination satisfied me that the case was one of pretty strongly marked relaxation of the symphysis pubis; but I reserved my opinion until the following day, when I insisted on seeing both the physicians together. Then, by following a hint given by Denman, taking with me a dry pelvis, I demonstrated what I believed to be the patient's condition, and called upon the older doctor to exonerate the younger from all blame. On both days I specially noted the patient's incapacity entirely to evacuate the bladder. After what she supposed a successful effort to do so,

I drew off, on the first occasion, about four ounces and a half of urine, and on the second about four ounces. I explained that this condition of the bladder was probably due, like the accumulation of scybala in the rectum, to the same cause which had produced the pubic relaxation. A binder was firmly placed about the patient's hips, and within a few weeks all trouble with the bladder had disappeared, but it was a year or so before she could walk with comfort.

Remarks by Prof. I. E. Taylor.

There is an American authority my friend Dr. Barker has omitted to name, who has made reference to the subject of relaxation and opening of the joints in the female pelvis during gestation—that is, Dr. Meigs. Dr. Meigs gave his full assent to the occurrence; while Roederer seems to have ignored it, and asserted that the head of the child could not by any means, even if it was large, produce any influence in enlarging the capacity of the pelvis, for the simple reason that the head of the child would be more readily moulded and compressed, than the articulations of the mother's pelvis would yield or open. His opinions, it appears, seem to have put a veto on the views that were entertained respecting the separation of the bones of the pelvis during labor. My own impression from some instances under observation is, and has been, that this relaxation or softening of the pelvic joints, and especially the pubic, is only a part of that great physiological process Nature institutes for delivery in the female economy during gestation—not confining itself to the changes in the body of the uterus and cervix, or the appendages. For we know that it has been manifested in the heart, and Coulson has remarked that the larger joints of the extremities have experienced this relaxing or softening influence.

It is conceded by many of the older obstetrical authorities that the soft tissues of the symphyses become infiltrated by a serous effusion; its structure and the capsules and the surrounding parts become enlarged, tender, and painful, and soft, and move easily one upon the other, covering each other in some instances. Boyer has asserted that they (the symphyses) have been opened as much as one-half an inch, Boivin to fully one inch. Meigs has borne testimony to the same result. In one of his cases, he has seen

it produce a crushing sound in a patient whenever she walked. In one of my patients the left knee could be partially luxated during gestation.

The anatomic structure of the symphysis pubis is somewhat different than the sacro-iliac symphyses,—the attachment of the tendon of the recti muscles to the pubic rami in the fibrous sheath—the infiltration surrounding the parts, extending to the bladder, the urethra and the vulva—creating the tenderness and sensibility and irritability of the bladder and the looseness of the joints.

This mobility and looseness is so perceptible in some cases, that if the patient attempts to stand up, if the right side is affected more than the left, the right ramus of the pubis will be elevated by the recti muscle of that side—if the left, the left ramus of the pubis—so with the sacro-iliac unions. This it is which produces the tottering or unsteady and uneven gait when trying to walk. Some patients have had a renewal of this softening or ramollissement of the symphyses in their pregnancies two or three times. I do not perceive, therefore, why these cases should not be common, equally as much in a physiological light, as the body of the uterus or its cervix, which is so much dwelt upon as a sign of pregnancy and as necessary in gestation. It is very apparent that this physiological state, as regards the uterus and its cervix, passes sometimes very rapidly, from various causes, into a pathological condition; so I conceive that the same view may be entertained regarding the symphyses of the pelvis during gestation.

Dr. Meigs has not found any benefit from the treatment by the bandage. I do not partake of this opinion, as I conceive it gives comfort, and aids in the adaptation of the joints to one another, and affords infinite pressure and strength, to the solution of an earlier restoration to a normal and healthy condition,—time and nature completing the cure by the physiological transformation again—as we know it does in the uterus itself after delivery.